MACTEC
engineering and constructing a better tomorrow

May 7, 2010

Mr. Kyle Clampitt, P.E.
Alliance Consulting Engineers, Inc.
Post Office Box 8147
Columbia, South Carolina 29202-8147

Subject: **Report of Preliminary Geotechnical Exploration**
East Plum Creek Industrial Park
Intersection of S.C. Hwy 34 & Cook Road
Fairfield County, South Carolina
MACTEC Project No. 6672-10-0706

Dear Mr. Clampitt:

As authorized by your acceptance of our Proposal No. PROP09COLM0126, dated December 4, 2009, MACTEC Engineering and Consulting, Inc. (MACTEC) has completed a preliminary subsurface exploration for the East Plum Creek Parcel in Fairfield County, South Carolina. The purpose of this exploration was to develop information about the site and subsurface conditions and to provide preliminary foundation recommendations for the proposed construction. This report describes the work performed and presents the results obtained, along with our preliminary geotechnical evaluation and recommendations for foundation design and site preparation.

Site and Project Information

We understand that the approximate 684-acre wooded site located southwest of the intersection of S.C. Hwy 34 and Cook Road in Fairfield County, South Carolina, is to be developed as a Class A Industrial/Business Park. Site topography is estimated to vary approximately ± 100 ft across the site. Several streams drain across the site in a general north to south alignment. At this time, we have not been provided with project information such as site topography, building locations, dimensions, structural loads, or finished floor elevations.

The above site and project information was obtained from telephone conversations between you and our Mr. Shaun Rankin, and emails including a site map furnished by Alliance Consulting Engineers, Inc.

MACTEC Engineering and Consulting, Inc.
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Field Exploration

Ten widely spaced soil test borings were drilled at the site at the approximate locations shown on the attached Boring Location Map, Figure 1. The boring locations were selected by MACTEC and were field located by MACTEC personnel using a hand held GPS unit. The borings were located on existing dirt trails or roadways to avoid the need for bulldozer access clearing. Topographic information for the site was not furnished.

The borings were made by mechanically twisting a continuous flight steel auger into the soil. Soil sampling and penetration testing were performed in general accordance with ASTM D 1586. At regular intervals, soil samples were obtained with standard 1.4-inch I.D., 2-inch O.D., split-tube sampler. The sampler was first seated 6 inches to penetrate any loose cuttings, and then driven an additional 12 inches with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final 12 inches was recorded and is designated the "penetration resistance". The penetration resistance, when properly evaluated, is an index to the soil's strength and foundation supporting capability.

Representative portions of the soil samples, thus obtained, were placed in glass jars and transported to the laboratory. In the laboratory, the samples were examined by a geotechnical engineer to verify the driller's field classifications. Test Boring Records are attached, showing the soil descriptions and penetration resistances.

Area Geology

The project site is located in the Piedmont Physiographic Province, an area underlain by ancient igneous and metamorphic rocks. The virgin soils encountered in this area are the residual product of in-place chemical weathering of rock which was similar to the rock presently underlying the site. In areas not altered by erosion or disturbed by the activities of man, the typical residual soil profile consists of clayey soils near the surface, where soil weathering is more advanced, underlain by sandy silts and silty sands. The boundary between soil and rock is not sharply defined. This transitional zone termed "partially weathered rock" is normally found overlying the parent bedrock. Partially weathered rock is defined, for engineering purposes, as residual material with standard penetration resistances in excess of 100 blows per foot. Weathering is facilitated by fractures, joints and by the presence of less resistant rock types. Consequently, the profile of the partially weathered rock and hard rock is quite irregular and erratic, even over short horizontal distances. Also, it is not unusual to find lenses and boulders of hard rock and zones of partially weathered rock within the soil mantle, well above the general bedrock level.

Often, the upper soils along drainage features and in flood plain areas are water-deposited (alluvial) materials that have been eroded and washed down from adjacent higher ground. These alluvial soils are usually soft and compressible, having never been consolidated by pressures in excess of their present overburden.

Subsurface Conditions

Topsoil with a thickness varying from about 1 inch to 3 inches was encountered in five of the borings. The other borings did not encounter topsoil, due to their location on dirt roadways. Topsoil depths across the wooded site may vary widely, and are likely deeper than the shallow topsoil found in the borings, due to their locations out of the woods.

Below surficial topsoil, water-deposited alluvial soils were encountered in B-3 and B-8, located near site drainage features. Boring B-3 encountered alluvium to refusal at 6 ft consisting of loose silty sand with trace of organics, with SPT N-values of 9 bpf. Boring B-8 encountered alluvium to 5 ft consisting of firm to stiff sandy clay, with SPT N-values of 7 to 9 bpf. Similar alluvial soils and possibly deeper soils, would be expected in the vicinity of site drainage features.

Weathered-in-place residual soils were typically encountered below the ground surface or topsoil in the borings, and below the alluvium in B-8. The sampled residuum consisted of firm to very stiff sandy silt and silt, (deeper hard sandy silt in B-2) and firm to very dense silty sand. Some of the residual soils contained a variable percentage of mica particles. SPT N-values in the sampled residuum ranged from 7 to 52 bpf.

Residual material hard enough to be designated partially weathered rock for engineering purposes (N>100 blows per foot) was encountered from 18.5 to 19 ft in B-2 and below 52.5 ft in B-4. The sampled partially weathered rock consisted of silty sand.

Refusal to the mechanical augers encountered at 67 ft in B-4, 6 ft in B-3 and 8.5 ft in B-8. The refusal in B-3 was directly below alluvial soils; the refusal in B-8 was about 2 ft below the bottom of the alluvium. At both borings B-3 and B-8, offset borings were drilled about 10 ft away from the original borings. The offset borings encountered refusal at the same depths as the adjacent original borings. Refusal may result from boulders, lenses, ledges or layers or relatively hard rock underlain by partially weathered rock or residual soil; refusal may also represent the surface of relatively continuous bedrock. Core drilling procedures are required to penetrate refusal materials and determine their character and continuity. Core drilling was beyond the scope of this exploration.

Groundwater was encountered at 5 ft in B-3 and 52 ft in B-4 at the time of drilling. Groundwater was not encountered in any of the other borings at the time of drilling. After 24 hours, the borings typically had remained dry. Boring B-3 was caved at 3 ft, which is likely due to shallow groundwater below this depth. Deep boring B-4 was not checked for stabilized groundwater but based on the time of boring groundwater level at 52 ft in B-4, it is likely that stabilized groundwater is present at or somewhat above this depth at this location.

Groundwater levels may fluctuate several feet with seasonal and rainfall variations and the water levels in nearby drainage features. Normally, the highest groundwater levels occur in late winter and spring and the lowest levels occur in late summer and fall.

The above descriptions provide a general summary of the subsurface conditions encountered. The attached Test Boring Records contain detailed information recorded at each boring location. These Test Boring Records represent our interpretation of the field logs based on engineering examination of the field samples. The lines designating the interfaces between various strata represent approximate boundaries and the transition between strata may be gradual.

Preliminary Geotechnical Evaluation and Recommendations

Foundations

Based on the boring data and our past experience with similar soils, the soils residual encountered in all the borings except B-3 and B-8 should provide adequate support for a system of shallow foundations for the proposed structures, subject to the criteria and site preparation recommendations that follow. Due to the typical wide spacing of the borings and the fact that building locations and final grades were not known at the time of the borings, the following recommendations should be considered preliminary. Additional borings located within the specific building footprint would be required for final geotechnical recommendations to be given.

Due to the significant topographic relief across the site, it is anticipated that significant depths of cut and fill will be required. For the residual soils, allowable soil bearing pressures would range from 3000 psf (N=7) to 6,000 psf or more in some deeper residual soils with N values of 20 bpf or more. In general, a soil bearing pressure of 3,000 to 4,000 pst should be assumed for spread footing support on a preliminary basis. For maximum column loads of 300 to 500 kips, foundation settlements on the order of 1 inch would be expected. Larger settlements would occur for heavier column loads. If moderately heavy to heavy column loads are present, geopiers or deep foundations could be required.

The alluvial soils as found in B-3 and B-8 would not be suitable to provide spread foundation support. Those areas could potentially be used for yard or paved areas, provided several feet of structural fill is placed over these soils.

For foundations bearing in structural fill compacted to 95 percent of the standard Proctor maximum dry density and placed on a properly prepared subgade, a maximum net soil bearing pressure of 3,000 psf may be used to size the foundations. If you wish to utilize a higher bearing pressure of 4,000 psf, the structural fill should be compacted to at least 98 percent. However, extra earthwork costs may be associated with this higher degree of compaction. The fill must be allowed time to settle before construction begins, as discussed later in this report.

General Foundation Recommendations

We recommend that masonry walls be provided with periodically spaced suitable construction joints, in order to accommodate some possible differential settlement and thermal stress. Individual column footings should bear entirely in very firm residual soil over their entire bearing area.

We recommend that the minimum widths for individual column and continuous wall footings be 24 and 18 inches, respectively. The minimum widths are considered advisable to provide a margin of safety against a local or punching shear failure of the foundation soils. Footings should bear at least 18 inches below final exterior grade and finished floor elevation to provide frost protection (for exterior footings) and protective embedment.

In order to verify that the soils encountered in footing excavations are similar to those encountered in the soil test borings, we recommend that foundation excavations be examined and checked with a dynamic hand penetrometer by an experienced engineering technician working under the direct supervision of the geotechnical engineer.

Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for long periods of time. Therefore, we recommend that all footing excavations be extended to final grade and the footings constructed as soon as possible to minimize the potential damage to bearing soils. The foundation bearing area should be level or suitably benched and be free of loose soil, ponded water and debris. Foundation concrete should not be placed on soils that have been disturbed by seepage. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight or if rainfall becomes imminent while the bearing soils are exposed, we recommend that a 2 to 4-inch thick "mud-mat" of "lean" (2000 psi) concrete be placed on the bearing soils before the placement of reinforcing steel.

Grade Slabs

The grade slabs may be soil supported in accordance with the recommendations in this report. The grade slab should be jointed around columns and along footing supported walls so that the slab and foundations can settle differentially without damage. Joints containing dowels may be used in the slab to permit movement between parts of the slab without cracking or sharp vertical displacements. We recommend that a suitable vapor barrier be placed below the slabs to minimize potential for soil moisture transmission through the slab. It would also be desirable to place 4 to 6 inches of well-compacted crusher run gravel placed on the prepared subgrade to serve as a working surface during construction and to provide an added degree of subgrade support at construction joints.

Site Preparation and Grading

All existing topsoil, disturbed soils and surface soils containing organic matter or other deleterious materials should be removed from within the proposed building and paved areas. After stripping and rough excavation grading, we recommend that areas to provide support for the foundations, floor slab, structural fill and any pavements be carefully inspected for soft surficial soils and proofrolled with a 25 to 35-ton, four-wheeled, rubber-tired roller or similar approved equipment. The proofroller should make at least four passes over each location, with the last two passes perpendicular to the first two. Any areas which wave, rut or deflect excessively and continue to do so after several passes of the proofroller should be undercut to firmer soils. The undercut areas should be backfilled in thin lifts with suitable compacted fill materials. The proofrolling and undercutting operations should be carefully monitored by an experienced engineering technician working under the direct supervision of the geotechnical engineer.

Groundwater

The contractor should be prepared to promptly remove any surface water, perched water, or groundwater from the construction area during site grading. This has been done effectively on past jobs by means of gravity ditches and pumping from filtered sumps. For excavation depths of less than about 20 ft below existing grades, the borings do not indicate the need for permanent underslab drainage. However, this will have to be confirmed after final grades are established and additional borings are drilled within specific building footprints. If any groundwater or perched water is encountered during site grading, the geotechnical engineer should be consulted to evaluate if localized permanent dewatering would be required in specific site areas.

Excavation

The residual soils generally encountered by the borings should be excavatable with conventional earth moving equipment such as dozers and pans. Local partially weathered rock was encountered as shallow as 18.5 ft below the ground surface in boring B-2 and refusal was encountered as shallow as 6 ft in B-3. Due to its typically erratic surface, such materials may be locally encountered during site grading in other portions of the site as well and potentially at even shallower depth. Heavy excavating equipment with ripping tools could be required to loosen dense residual soils and partially weathered rock for efficient removal. Confined excavations (footings, utility trenches, etc.) in partially weathered rock may require ripping tools and pneumatic hammers.

Engineered Fill

Any fill used for raising site grade or for replacement of material that is undercut should be uniformly compacted in thin lifts to at least 95 percent of the standard Proctor maximum dry density (ASTM D 698). In addition, at least the upper 18 inches of subgrade fill beneath pavements and floor slabs and 24 inches below pavements subject to truck traffic should be compacted to 100 percent of the same specification. Specific pavement or floor slab designs may require further compaction. In cut areas of the site, undisturbed residual soils should provide adequate floor slab support after proofrolling.

Although we have not performed any laboratory classification or compaction testing, based on our visual examination and experience with similar type soils, on-site low plasticity residual soil appears to be suitable for use as structural fill, after moisture adjustment as required. In general, soils containing more than 5 percent (by weight) fibrous organic materials or having a Plasticity Index (PI) greater than 30 (less than 15 is preferable) should not be used for fill.

Before filling operations begin, representative samples of the proposed fill material should be collected and tested to determine the compaction and classification characteristics. The maximum dry density and optimum moisture content should be determined. Once compaction begins, a sufficient number of density tests should be performed by an experienced engineering technician working under the direct supervision of the geotechnical engineer to measure the degree of compaction being obtained.

In site areas where several feet of structural fill will be placed to achieve proposed grades, we recommend that construction be delayed to allow time for the underlying soils and fill to "settle out" as they adjust to the overlying weight of materials. In the deepest fill areas, a period of several weeks may be required for this adjustment. Settlement pins installed at the top of the fill and monitored with a precision level would aid in determining when settlements are negligible and construction could begin.

The edge of the structural fill should extend horizontally beyond the outside edge of the building foundations at least 10 ft or a distance equivalent to one-third the height of fill to be placed, whichever is greater, before sloping. The outer edge of fill should be at least 5 ft beyond paved areas. We have not performed any laboratory triaxial shear tests for slope stability calculations, but our experience suggests that permanent cut and fill slopes placed on a suitable foundation should be constructed at 2:1 (horizontal to vertical) and 2.5:1, respectively, or flatter. Fill slopes should be adequately compacted. Cut and fill slope surfaces should be protected from erosion by grassing or other means. Permanent slopes of 3:1 or flatter may be desirable for mowing.

The surface of compacted subgrade soils can deteriorate and lose its support capabilities when exposed to environmental changes and construction activity. Deterioration can occur in the form of freezing, formation of erosion gullies, extreme drying, exposure for a long period of time or rutting by construction traffic. We recommend that the surfaces of floor slab and pavement subgrades that have deteriorated or softened be proofrolled, scarified and recompacted (and additional fill placed, if necessary) immediately prior to construction of the floor slab or pavement. Additionally, any excavations through the subgrade soils (such as utility trenches) should be properly backfilled in compacted lifts. Recompaction of subgrade surfaces and compaction of backfill should be checked with a sufficient number of density tests to determine if adequate compaction is being achieved.

Site Seismic Class

Based on the results of the borings and in particular deep boring B-4, the site classifies as seismic site class D by the average N method of IBC 2009. This is based on the existing grades at the borings.

Qualification of Report

Our evaluation of foundation support conditions for this preliminary geotechnical exploration has been based on our understanding of the project and site information and the data obtained in our exploration. The general subsurface conditions utilized in our evaluation of foundations are based on interpolation of subsurface data between the widely spaced borings. In evaluating the boring data obtained in this preliminary geotechnical exploration, we have examined previous correlations between penetration resistances and foundation bearing pressures observed in soil conditions similar to those at your site.

Since this preliminary exploration provides only general soil conditions over the subject site, additional subsurface exploration (more borings and/or test pits, further engineering evaluation and laboratory testing) will be required for final foundation design and for determining more specific site preparation procedures. The final exploration should be performed after the locations, configurations, loading conditions, and finished floor elevations have been finalized. The assessment of site environmental conditions or the presence of pollutants in the soil, rock and ground water of the site was beyond the scope of this exploration.

Closing

Thank you for the opportunity to provide our professional geotechnical services during this phase of your project. Please contact us when we can be of further service or if you have any questions concerning this report.

Sincerely,

MACTEC ENGINEERING AND CONSULTING, INC.

Linda Campbell
Jon N. Honeycutt
Staff Engineer

Mel Y. Browning
Mel Y. Browning, P.E.
Principal Geotechnical Engineer
Registered, S.C. 8807

MEL Y. BROWNING
No. 8807

MACTEC ENGINEERING AND CONSULTING
No. C01537

JOH/MYB:lec

Attachments

For Jon Honeycutt
With Permission

EXPLANATION

● B-1 APPROXIMATE SOIL BORING LOCATION

REF: BORING LOCATION MAP PREPARED FROM PDF FILE PROVIDED BY ALLIANCE CONSULTING ENGINEERS, INC., DATED NOVEMBER 2009.

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ENGINEERING & CONSULTING, INC.
CHARLOTTE, NORTH CAROLINA

BORING LOCATION MAP

EAST PLUM CREEK PARCEL
INTERSECTION OF EAST PEACH ROAD AND COOK ROAD
FAIRFIELD COUNTY, SOUTH CAROLINA

PREPARED BY JNH	DATE 5/7/10	CHECKED MYB	DATE 5/7/10
JOB NO.	6672-10-0706	FIGURE	1

P:\AutoCAD Drawings Only "CHECK OUT BEFORE DELETING\Geotechnical\2010\6672-10-0706 EAST PLUM CREEK\BORING LOCATION MAP.dwg Thu, 06 May 2010 - 10:22am ddsnyder

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel - sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel - sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel - sand - silt mixtures.
			GC	Clayey gravels, gravel - sand - clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, well graded sands with gravel.
			SP	Poorly graded sands, poorly graded sands with gravel.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands.
			SC	Clayey sands.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts, sandy or clayey silts with low plasticity.
			CL	Inorganic clays of low plasticity.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of high plasticity, organic silts.
CORED ROCK			RK	Rock

<u>BOUNDARY CLASSIFICATIONS</u>: Soils possessing characteristics of two groups are designated by combinations of group symbols.

SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4" 3" 12"

U.S. STANDARD SIEVE SIZE

Reference: "Classification of Soils for Engineering Purposes" (Unified Soil Classification System) ASTM D 2487, and/or "Description and Identification of Soils" (Visual-Manual Procedure), ASTM D 2488.

■	Undisturbed Sample	▮	Auger Cuttings
☒	Split Spoon Sample	≋	Bulk Sample
▯	Rock Core	▩	Crandall Sampler
▩	Dilatometer	^	Pressure Meter
▯	Packer	○	No Recovery
▽	Water Table at time of drilling	▼	Water Table after 24 hours
▨	Caved Depth		WOH = Weight of Hammer

Monitoring Well Explanation

▧ Cement ▮ Bentonite ▥ Sand Filter ▤ Screen

Correlation of Penetration Resistance with Relative Density and Consistency

SAND & GRAVEL		SILT & CLAY	
No. of Blows	Relative Density	No. of Blows	Consistency
0 - 4	Very Loose	0 - 1	Very Soft
5 - 10	Loose	2 - 4	Soft
11 - 20	Firm	5 - 8	Firm
21 - 30	Very Firm	9 - 15	Stiff
31 - 50	Dense	16 - 30	Very Stiff
Over 50	Very Dense	Over 31	Hard

MACTEC

KEY TO SYMBOLS AND DESCRIPTIONS

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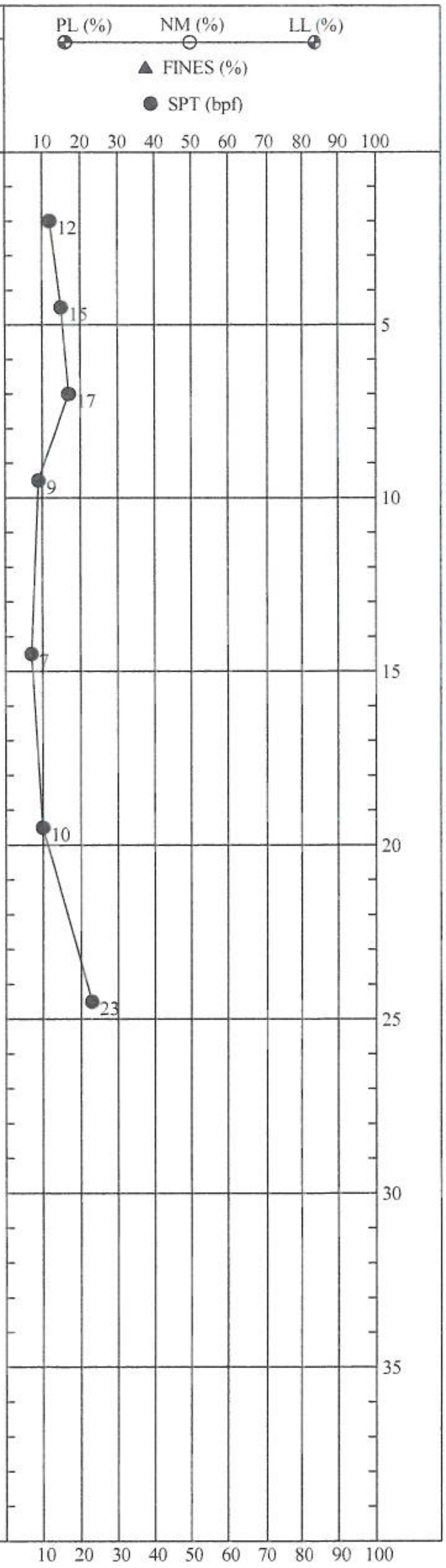
DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)	SAMPLES IDENT	TYPE	N-COUNT 1st 6" 2nd 6" 3rd 6"
0	**TOPSOIL** - Approximately 1 inch **RESIDUUM** - Stiff to Stiff Red Fine Sandy SILT					
				SS-1	☒	4-6-6
5				SS-2	☒	7-8-7
				SS-3	☒	7-8-9
	Stiff to Firm Orange Micaceous Very Fine Sandy SILT					
10				SS-4	☒	4-4-5
15				SS-5	☒	3-3-4
	Stiff to Very Stiff Orange Tan Micaceous Fine Slightly Sandy SILT with Weathered Quartz Fragments.					
20				SS-6	☒	4-5-5
				SS-7	☒	8-10-13
25	Boring Terminated at 25 ft Groundwater Not Encountered at Time of Boring or after 24 hrs.					
30						
35						
40						



DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

PREPARED BY: JNH
CHECKED BY: MYB

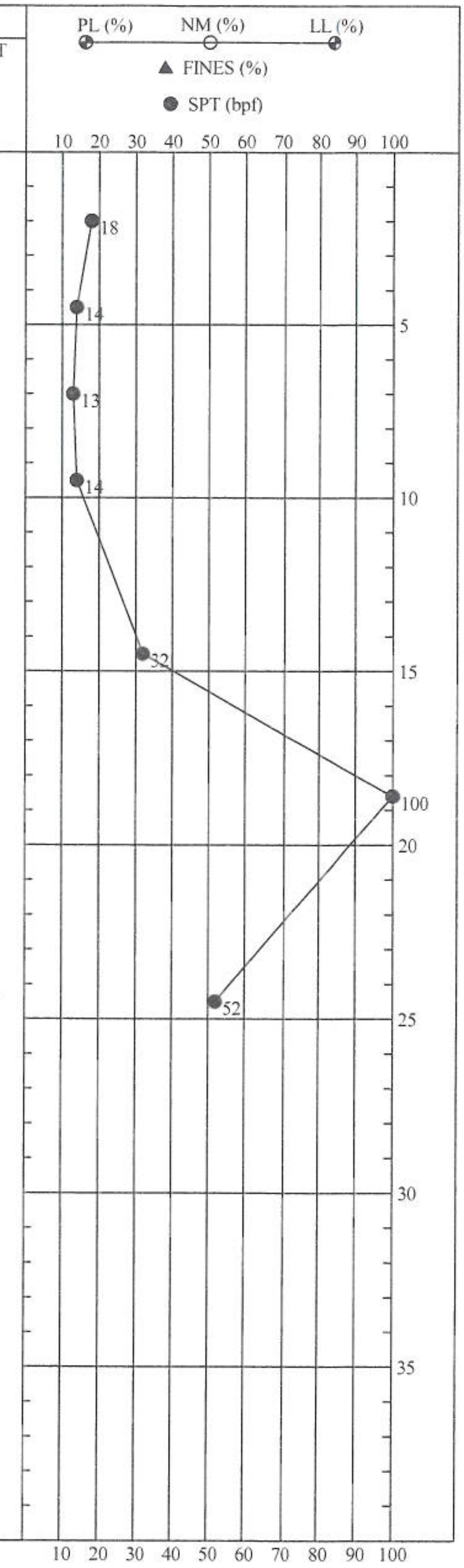
THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL BORING TEST RECORD

PROJECT: Fairfield County
BORING NO.: B-1
COORD N:
COORD E:
DRILLED: April 20, 2010
PROJ. NO.: 6672-10-0706
PAGE 1 **OF** 1

MACTEC Engineering & Consulting, Inc.

SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)	SAMPLES IDENT	TYPE	N-COUNT 1st 6" 2nd 6" 3rd 6"
RESIDUUM - Very Stiff to Stiff Red Fine Sandy SILT					
			SS-1		5-8-10
			SS-2		5-7-7
			SS-3		5-6-7
Stiff Orange Micaceous Fine Sandy SILT					
			SS-4		6-7-7
Hard Tan Fine Sandy SILT					
			SS-5		8-15-17
PARTIALLY WEATHERED ROCK - Sampled as Tan Slightly Micaceous Stiff Fine to Coarse SAND			SS-6		50/2
Very Dense Tan Micaceous Silty Fine to Medium SAND					
			SS-7		22-25-27
Boring Terminated at 25 ft Groundwater Not Encountered at Time of Boring or after 24 hrs.					



SOIL LOG FAIRFILED COUNTY.GPJ 5/7/10

DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

PREPARED BY: JMH
CHECKED BY: MYB

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL BORING TEST RECORD

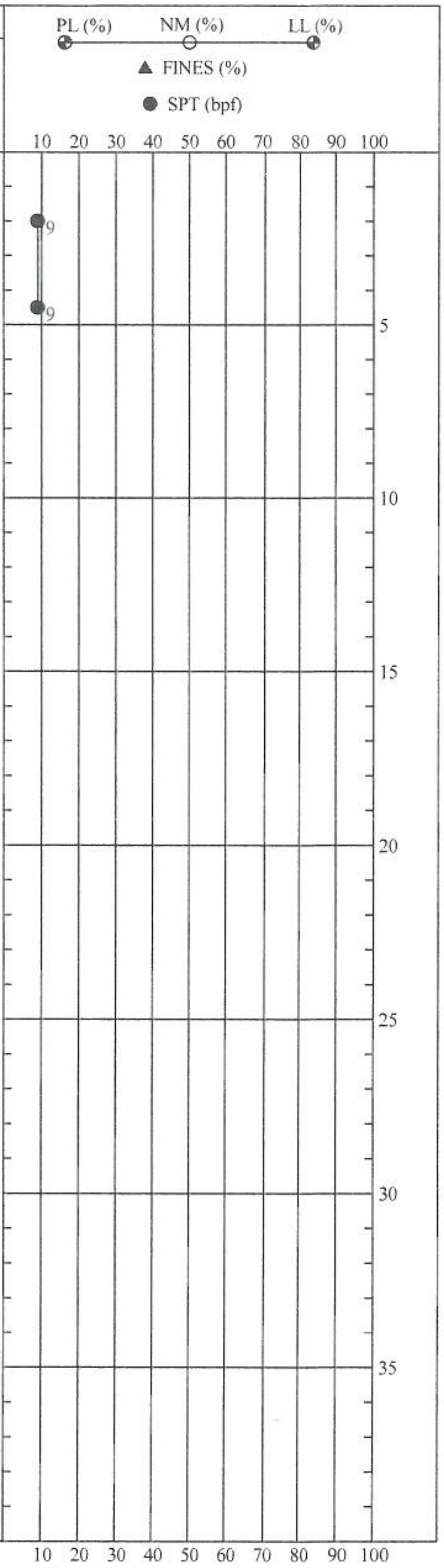
PROJECT: Fairfield County
BORING NO.: B-2
COORD N:
COORD E:
DRILLED: April 20, 2010
PROJ. NO.: 6672-10-0706
PAGE 1 **OF** 1

MACTEC Engineering & Consulting, Inc.

SOIL CLASSIFICATION AND REMARKS

SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS	LEGEND	ELEV (ft)	SAMPLES IDENT	TYPE	N-COUNT 1st 6" 2nd 6" 3rd 6"
0	**TOPSOIL** - 3 inches **ALLUVIUM** - Loose Dark Brown Fine SAND with Trace Organics (roots)			SS-1	☒	3-4-5
	ALLUVIUM - Loose Orange Fine SAND with Trace Organics (roots)			SS-2	☒	4-4-5
5						
	Auger Refusal and Boring Terminated at 6.0 ft Boring Offset 10 ft North with Auger Refusal at 6.0 ft Groundwater Measured at 5.0 ft after Boring Completion Borehole Caved at 3 ft after 24 hrs					
10						
15						
20						
25						
30						
35						
40						



DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

PREPARED BY: JNH
CHECKED BY: MYD

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL BORING TEST RECORD

PROJECT: Fairfield County
BORING NO.: B-3
COORD N:
COORD E:
DRILLED: April 21, 2010
PROJ. NO.: 6672-10-0706
PAGE 1 **OF** 1

MACTEC Engineering & Consulting, Inc.

SOIL CLASSIFICATION AND REMARKS

SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

DEPTH (ft) | LEGEND | ELEV (ft)

RESIDUUM - Very Stiff to Stiff Red Fine Slightly Sandy SILT

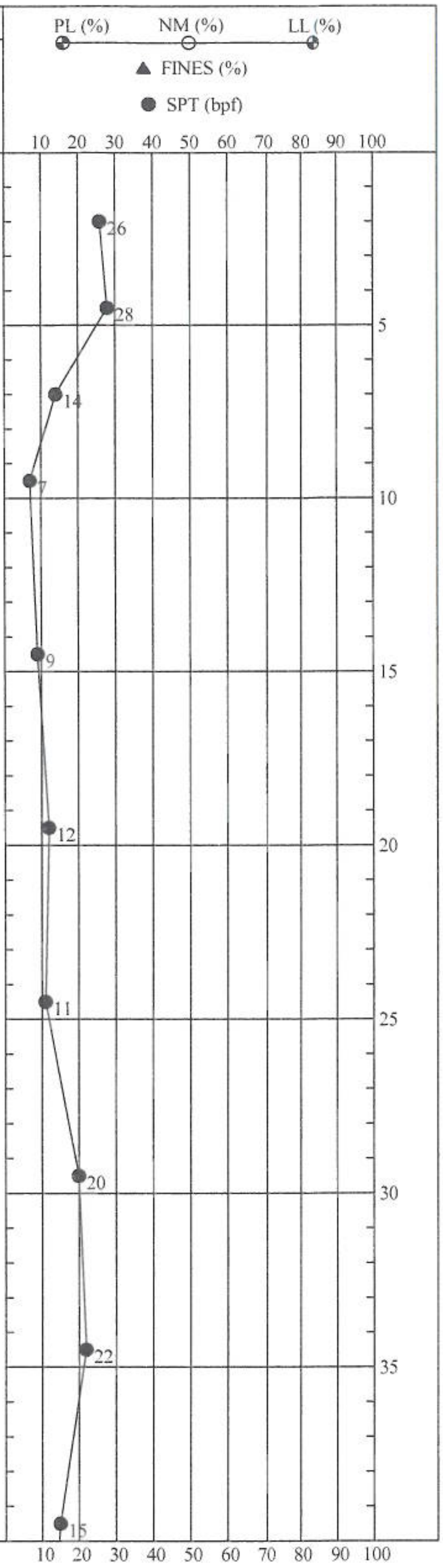
Firm to Stiff Orange Tan Brown Micaceous Fine Sandy SILT

Firm to Very Firm Tan White Micaceous Silty Fine SAND

Stiff Olive Very Micaceous SILT

SAMPLES

IDENT	TYPE	N-COUNT 1st 6" 2nd 6" 3rd 6"
SS-1	☒	8-12-14
SS-2	☒	10-13-15
SS-3	☒	5-6-8
SS-4	☒	3-3-4
SS-5	☒	5-4-5
SS-6	☒	5-6-6
SS-7	☒	4-5-6
SS-8	☒	7-8-12
SS-9	☒	10-10-12
SS-10	☒	4-6-9



DEPTH: 0 5 10 15 20 25 30 35 40

DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

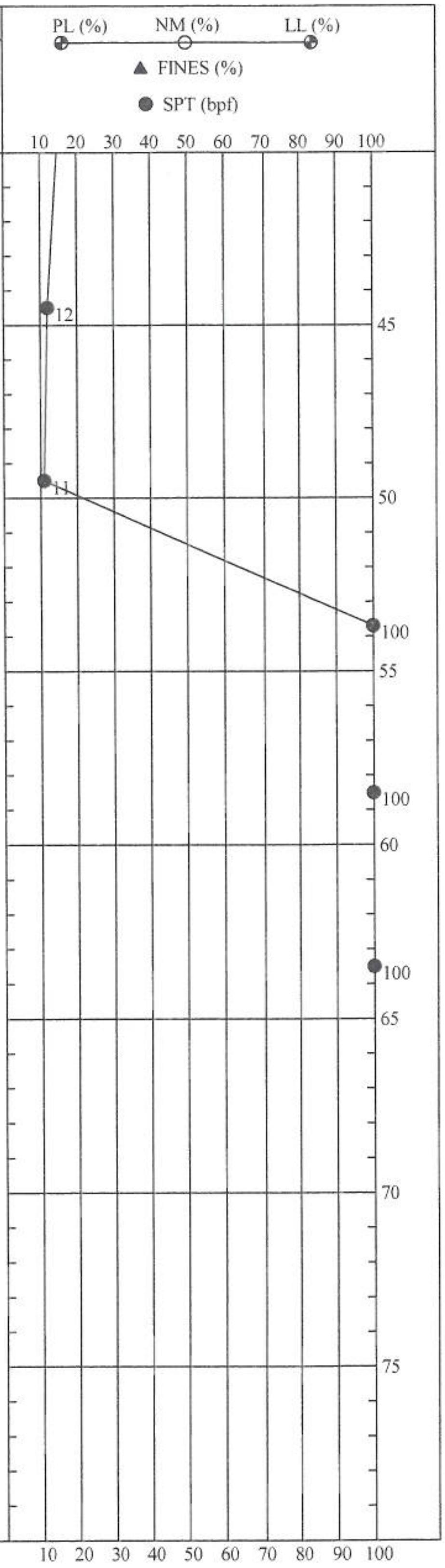
PREPARED BY: JNH
CHECKED BY: MYB

SOIL BORING TEST RECORD

PROJECT: Fairfield County
BORING NO.: B-4
COORD N:
COORD E:
DRILLED: April 21, 2010
PROJ. NO.: 6672-10-0706
PAGE 1 **OF** 2

MACTEC Engineering & Consulting, Inc.

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	IDENT	TYPE	N-COUNT (1st 6" 2nd 6" 3rd 6")
40	Stiff Olive Very Micaceous SILT			
	Stiff Tan Very Fine Sandy SILT (wet)			
		SS-11	☒	4-5-7
45				
		SS-12	☒	4-5-6
50				
	PARTIALLY WEATHERED ROCK - Sampled as Gray Fine SAND			
		SS-13		50/3"
55				
	PARTIALLY WEATHERED ROCK - Sampled as Gray Silty Fine to Coarse SAND			
		SS-14		50/1"
60				
		SS-15		50/0"
65				
	Auger Refusal and Boring Terminated at 67 ft Groundwater Measured at 52 ft after Boring Completion			
70				
75				
80				



DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

PREPARED BY: JNH
CHECKED BY: MYB

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL BORING TEST RECORD

PROJECT: Fairfield County
BORING NO.: B-4
COORD N:
COORD E:
DRILLED: April 21, 2010
PROJ. NO.: 6672-10-0706
PAGE 2 **OF** 2

MACTEC Engineering & Consulting, Inc.

SOIL CLASSIFICATION AND REMARKS

SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

RESIDUUM - Very Stiff to Stiff Red Very Stiff to Stiff Fine Slightly Sandy SILT

Firm Tan Silty Very Fine SAND

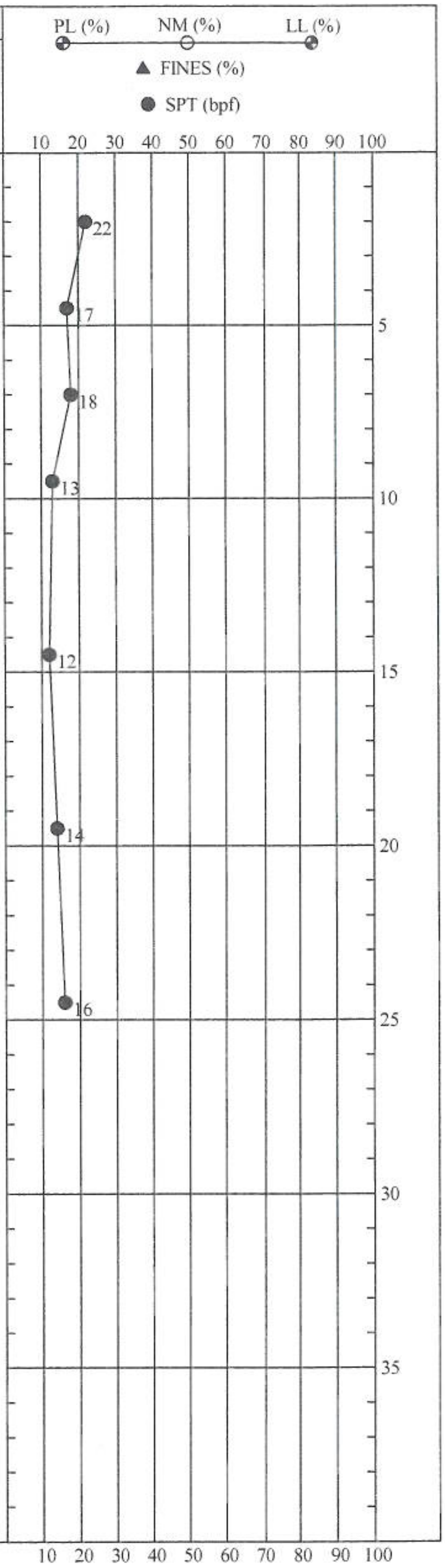
Very Stiff Orange Fine Sandy SILT

Very Stiff Tan Micaceous Fine Slightly Sandy SILT

Boring Terminated at 25 ft
Groundwater Not Encountered at Time of Boring or after 2 hrs

SAMPLES

IDENT	TYPE	N-COUNT 1st 6" 2nd 6" 3rd 6"
SS-1	☒	6-10-12
SS-2	☒	7-8-9
SS-3	☒	8-8-10
SS-4	☒	6-6-7
SS-5	☒	9-6-6
SS-6	☒	8-6-8
SS-7	☒	7-8-8



DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

PREPARED BY: JNH
CHECKED BY: MYB

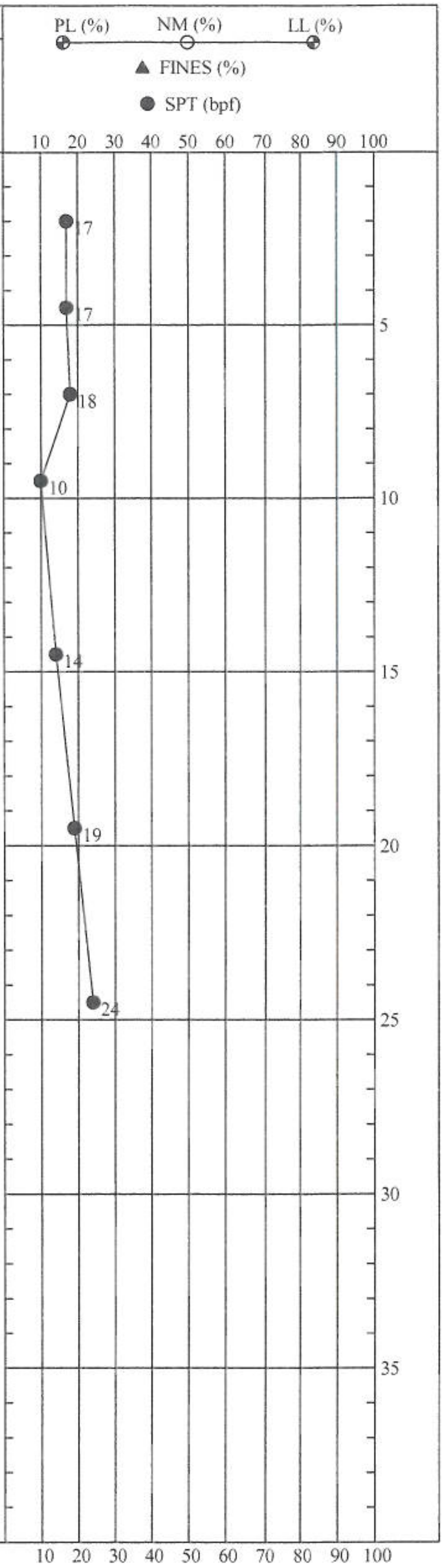
THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL BORING TEST RECORD

PROJECT: Fairfield County
BORING NO.: B-5
COORD N:
COORD E:
DRILLED: April 22, 2010
PROJ. NO.: 6672-10-0706
PAGE 1 **OF** 1

MACTEC Engineering & Consulting, Inc.

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)	SAMPLES IDENT	SAMPLES TYPE	SAMPLES N-COUNT 1st 6" 2nd 6" 3rd 6"
0	**RESIDUUM** - Very Stiff Red Fine Sandy SILT					
				SS-1	☒	6-8-9
				SS-2	☒	7-8-9
5						
				SS-3	☒	8-9-9
	Stiff Tan Fine Sandy SILT					
				SS-4	☒	6-5-5
10						
	Stiff Orange Micaceous Fine to Medium Slightly Sandy SILT					
				SS-5	☒	10-8-6
15						
	Firm to Very Firm Tan Silty Fine SAND					
				SS-6	☒	10-10-9
20						
				SS-7	☒	10-12-12
25	Boring Terminated at 25.0 ft Groundwater Not Encountered at Time of Boring or after 1 hr					
30						
35						
40						



SOIL LOG FAIRFILED COUNTY.GPJ 5/7/10

DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

PREPARED BY: JNH
CHECKED BY: MYB

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL BORING TEST RECORD

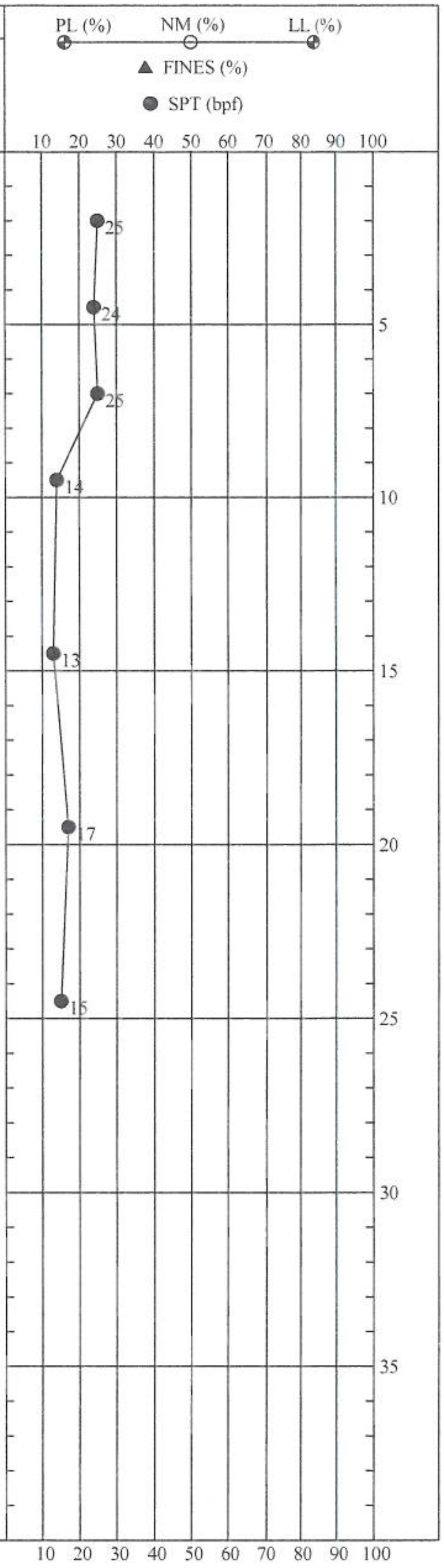
PROJECT: Fairfield County **BORING NO.:** B-6
COORD N:
COORD E:
DRILLED: April 22, 2010
PROJ. NO.: 6672-10-0706 **PAGE** 1 **OF** 1

MACTEC Engineering & Consulting, Inc.

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)
0	**TOPSOIL** - 1 inch		
	RESIDUUM - Very Stiff Red Fine Slightly Sandy SILT		
5			
	Stiff Light Orange SILT		
10			
	Stiff Red Micaceous SILT		
15			
	Very Stiff Orange Fine Sandy SILT		
20			
	Stiff Tan SILT		
25	Boring Terminated at 25 ft Groundwater Not Encountered at Time of Boring or after 24 hrs		
30			
35			
40			

SAMPLES

IDENT	TYPE	N-COUNT 1st 6" 2nd 6" 3rd 6"
SS-1	☒	7-12-13
SS-2	☒	9-12-12
SS-3	☒	10-12-13
SS-4	☒	8-7-7
SS-5	☒	8-6-7
SS-6	☒	10-9-8
SS-7	☒	8-7-8



DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

PREPARED BY: JNH
CHECKED BY: MYB

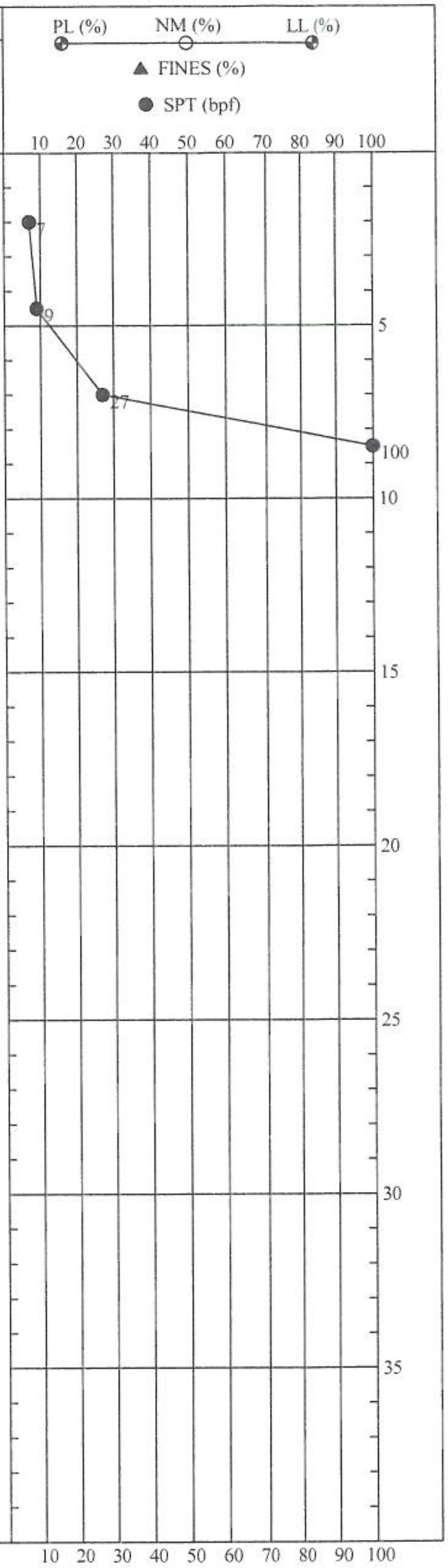
THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL BORING TEST RECORD

PROJECT: Fairfield County **BORING NO.:** B-7
COORD N:
COORD E:
DRILLED: April 21, 2010
PROJ. NO.: 6672-10-0706 **PAGE** 1 **OF** 1

MACTEC Engineering & Consulting, Inc.

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)	SAMPLES IDENT	SAMPLES TYPE	SAMPLES N-COUNT 1st 6" 2nd 6" 3rd 6"
0	**TOPSOIL** - 2 inches **ALLUVIUM** - Firm to Stiff Gray Tan Fine Sandy CLAY	▨				
				SS-1	☒	3-3-4
				SS-2	☒	3-4-5
5						
	RESIDUUM - Very Firm Tan Slightly Silty Fine to Medium SAND with Weathered Rock Fragments			SS-3	☒	8-9-18
				SS-4		50/0"
	Auger Refusal and Boring Terminated at 8.5 ft Boring offset 10 ft South with Auger Refusal at 8.5 ft Groundwater Not Encountered at Time of Boring or after 24 hrs					
10						
15						
20						
25						
30						
35						
40						



SOIL LOG FAIRFILED COUNTY.GPJ 5/7/10

DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

PREPARED BY: JNH
CHECKED BY: MYB

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL BORING TEST RECORD

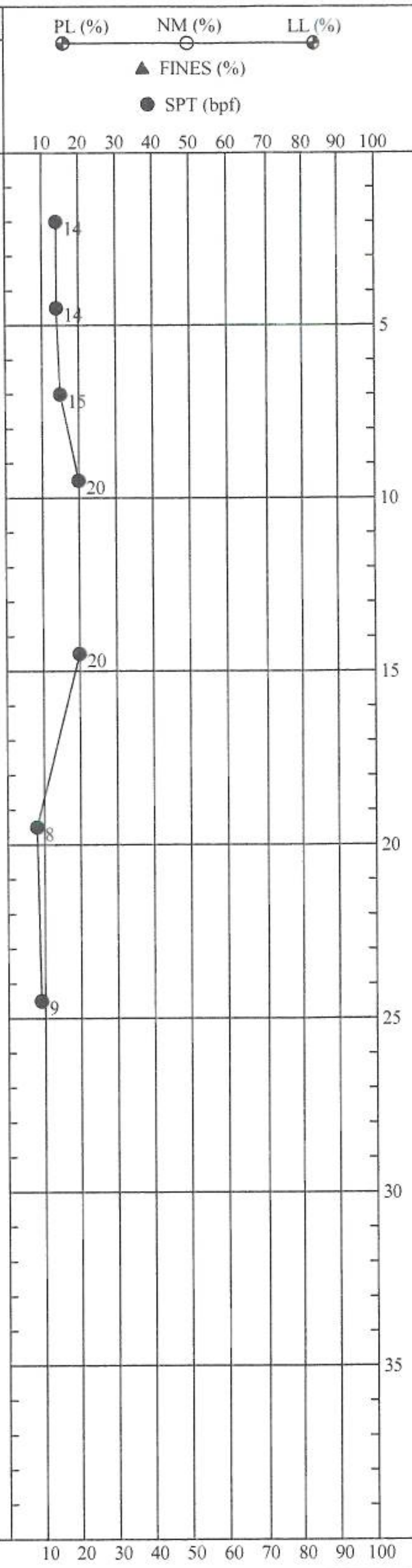
PROJECT: Fairfield County
BORING NO.: B-8
COORD N:
COORD E:
DRILLED: April 21, 2010
PROJ. NO.: 6672-10-0706
PAGE 1 **OF** 1

MACTEC Engineering & Consulting, Inc.

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)
0	**TOPSOIL** -1 inch **RESIDUUM** - Stiff to Very Stiff Red Brown Fine Sandy SILT		
12.5	Very Stiff to Firm Red Fine Sandy SILT		
22.5	Firm Yellow Red Fine Slightly Sandy SILT		
25	Boring Terminated at 25 ft Groundwater Not Encountered at Time of Boring or after 24 hrs		

SAMPLES

IDENT	TYPE	N-COUNT 1st 6" 2nd 6" 3rd 6"
SS-1	☒	5-7-7
SS-2	☒	6-7-7
SS-3	☒	6-7-8
SS-4	☒	7-8-12
SS-5	☒	6-8-12
SS-6	☒	3-4-4
SS-7	☒	4-4-5



SOIL LOG FAIRFILED COUNTY.GPJ 5/7/10

DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

PREPARED BY: JNH
CHECKED BY: MYB

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL BORING TEST RECORD

PROJECT: Fairfield County
BORING NO.: B-9
COORD N:
COORD E:
DRILLED: April 21, 2010
PROJ. NO.: 6672-10-0706
PAGE 1 **OF** 1

MACTEC Engineering & Consulting, Inc.

DEPTH (ft)

SOIL CLASSIFICATION AND REMARKS

SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

LEGEND | ELEV (ft)

RESIDUUM - Very Stiff Red Fine Sandy SILT

Stiff Orange Fine Slightly Sandy SILT

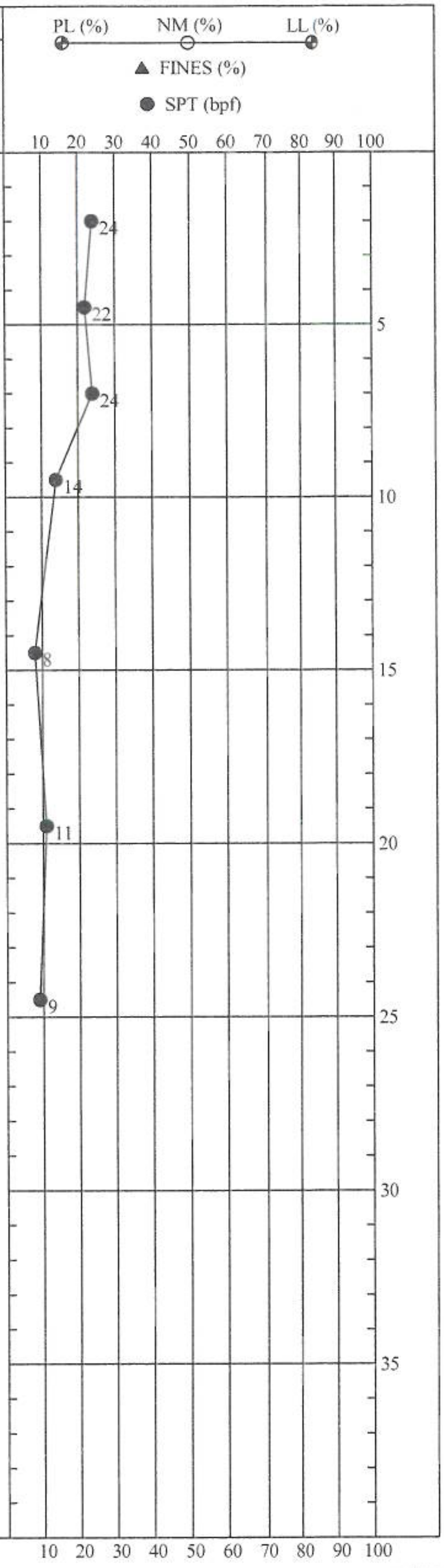
Stiff Brown Micaceous Fine Slightly Sandy SILT

Stiff Yellow Tan Fine Slightly Sandy SILT

Boring Terminated at 25 ft
Groundwater Not Encountered at Time of Boring or after 3 hrs

SAMPLES

IDENT	TYPE	N-COUNT 1st 6" 2nd 6" 3rd 6"
SS-1	☒	6-12-12
SS-2	☒	7-10-12
SS-3	☒	8-11-13
SS-4	☒	8-7-7
SS-5	☒	3-4-4
SS-6	☒	3-5-6
SS-7	☒	4-4-5



0 5 10 15 20 25 30 35 40

SOIL LOG FAIRFILED COUNTY.GPJ 5/7/10

DRILLER: Landprobe
EQUIPMENT: Automatic Hammer
METHOD: 2 1/4 Hollow Stem Auger
HOLE DIA.: 6 inches
REMARKS:

PREPARED BY: JNH
CHECKED BY: MYB

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL BORING TEST RECORD

PROJECT: Fairfield County
BORING NO.: B-10
COORD N:
COORD E:
DRILLED: April 22, 2010
PROJ. NO.: 6672-10-0706
PAGE 1 **OF** 1

MACTEC Engineering & Consulting, Inc.